Technical Appendix

This set of tables is part of a biennial series of studies on the income of the aged that began with data from 1976.[1] The technical appendix describes the data source of this series, defines some key variables found in the tables, and discusses the reliability of the estimates.

Source of Data

Data for this series are provided by the March Current Population Survey (CPS) of the U.S. Census Bureau.[2] The CPS samples a large cross section of households in the United States each year (approximately 50,000 in March 1999). The March supplement gathers detailed information on income and labor force participation of each person 15 years of age or older in the sample households. For this series, a subsample of persons 55 or older is created, arranged in aged units with a separate data record for each married couple living together—at least one of whom is 55 or older—and for each nonmarried person 55 or older. Married persons living apart are classified as nonmarried persons.

From time to time, changes have been made in the survey. Although the changes have improved the measurement of income and labor force participation, they have reduced the comparability of estimates made in different years.[3]

Definitions

Aged unit.—The major unit of analysis in Social Security surveys of the aged has been the aged unit rather than the construct of families and unrelated individuals used by the Census Bureau. With 55 as the age cutoff, aged units are married couples living together—at least one of whom is 55 or older—and nonmarried persons 55 or older. Persons who are married but not living with a spouse are included in the nonmarried persons category.

Certain differences exist between Cenus Bureau and SSA figures because the units of analysis are not directly comparable. Aged persons living with a younger relative who is considered the householder are classified by the Census Bureau as members of nonaged families.[4] Also, nonmarried individuals are treated simply as nonmarried persons by SSA. In comparison, the Census Bureau counts nonmarried persons living with other relatives as part of a family and nonmarried persons who are living alone or with nonrelatives as unrelated individuals. The Census Bureau's family category includes both married couples and those nonmarried persons who are living with relatives.

Census data show that the number of households with the householder aged 65 or older was 21,589,000.[5] In comparison, SSA data show that there were 24,644,000 units aged 65 or older in 1998. The SSA count generally includes the Census Bureau's aged households plus some aged units living in nonaged households or living with other aged units in the same household. The number of aged households was 88 percent of the number of aged units.

Age.—These tabulations cover units aged 55 or older (see definition of aged unit above). The age of a married couple is defined as the age of the husband—unless he is under 55 and the wife is 55 or older, in which case it is the age of the wife.

Total money income.—Total money income is calculated as the sum of all income received by the aged unit—before any deductions such as taxes, union dues, or Medicare premiums—from the following sources: wages and salaries, self-employment income (including losses), Social Security, Supplemental Security Income, public assistance, interest, dividends, rent, royalties, estates or trusts, veterans' payments, unemployment and workers' compensations, private and government retirement and disability pensions, alimony, child support, and any other source of money income that was regularly received. Capital gains (or losses) and lump-sum or one-time payments such as life insurance settlements are excluded.

Total money income does not reflect non-money transfers such as food stamps, health benefits, subsidized housing, payments in kind, or fringe benefits from one's employment.

To reduce the amount of nonsampling error resulting from nonresponses, the Census Bureau has devised procedures to impute work and income data for all persons for whom this information is missing. Amounts assigned to a nonrespondent are those observed for another person with similar demographic and economic characteristics who did respond.[6]

Aged unit income.—Aged unit income is either the income of a nonmarried person or the sum of income from both spouses in a married couple. A married couple receives a source if one or both persons are recipients of that source.

Family income.—Family income is calculated as the sum of total money income of all persons related by blood, marriage, or adoption and residing together. Total money income is the same as family income for aged units who live with no other relatives.

 Measurement of poverty.—The poverty concept, originally developed in 1964 by Mollie Orshansky of the Social Security Administration and revised by federal interagency committees in 1969 and 1981, consists of a set of thresholds that vary by family size and composition. There are 48 thresholds for families composed of one to nine or more persons cross-classified by the presence and number of family members under age 18 (from no children to eight or more). One-

and two-person families are further differentiated by the age of the family householder (under age 65 and aged 65 or older).

The poverty index for families of three or more persons is based on the cost of the Department of Agriculture's economy food plan, multiplied by the ratio of income to food costs derived from the 1955 Household Food Consumption Survey. The factors used to derive the poverty index from food costs for one- and two-person families were higher. These criteria for determining the extent of poverty in the United States have become the basis for the official statistics issued annually by the Bureau of the Census in "Characteristics of the Population Below the Poverty Level," *Current Population Reports,* Series P-60. The poverty levels are adjusted to reflect changes in the annual average Consumer Price Index.

The poverty index was originally developed at a time when public noncash benefits for both non-needy and needy families were relatively small and unimportant. It was, therefore, developed as a measure of income inadequacy of money income only. Nonmoney income is, therefore, not currently considered in calculating the poverty thresholds.

The official poverty measures used by the Bureau of the Census compare family total money income with the appropriate thresholds. Families as well as all persons in families with income below the appropriate threshold are considered poor. Tables VIII.1–6 of this report present measures of the poverty status of aged units based on their family income, similar to the official measures. They may, however, differ from Census estimates because of differences in the way in which families are classified as "aged" or not. Tables VIII.11–13, which were added in 1996, present measures of the poverty status of aged persons based on their family income, consistent with the official measures.

This report also presents selected "unofficial" measures of poverty by comparing total money income of aged units with thresholds for one- or two-person units under age 65 and 65 or older, even though some aged units live with other relatives (tables IV.4 and VIII.6–10), comparing aged unit amounts of retirement income with one- and two-person unit thresholds (table IV.4) and comparing family total money income other than Social Security benefits with the family poverty thresholds (table VIII.5).

Interest also centers on the number who have incomes only slightly above the poverty line. This group, sometimes called the near poor, have incomes between the poverty line and 125 percent of the poverty line. Estimates of proportions who are poor or near poor are presented in tables VIII.1–4 and VIII.7–10.

In May 1995, the Committee on National Statistics of the National Academy of Sciences released a report on poverty measurement entitled *Measuring Poverty: A New Approach* that contained a number of recommendations for improving the measurement of poverty.[7] Among the recommendations are expanding the income definition to include the growing amount of near-money income (such as food stamps and subsidized housing), and taking into account such expenses as income and payroll taxes, child care and other work-related expenses, out-of-pocket medical expenses, and payments of child support payments to another household. In 1997 the Office of Management and Budget formed a working group, under the auspices of the Interagency Council on Statistical Policy, to conduct a review of the available options for revising the definition of poverty. The group has coordinated with the Census Bureau to develop experimental poverty measures that incorporate the NAS recommendations.[8]

Reporting of income.—Income amounts reported by persons in the CPS are somewhat less than amounts derived from independent sources such as the Bureau of Economic Analysis, Social Security Administration, and the Department of Veterans Affairs. A comparison of aggregates from the March 1990 CPS (reported and allocated) with independent estimates found that the CPS accounted for 97 percent of wages and salaries, 97 percent of Social Security and Railroad Retirement benefits, 103 percent of private pensions and annuities, 83 percent of federal government and military retirement, 77 percent of state and local government retirement, 89 percent of Supplemental Security Income payments, 51 percent of interest, and 33 percent of dividends.[9] A matching of 1972 data from the Census Bureau, SSA, and Internal Revenue Service sources has provided a rich source for methodological comparisons of record and survey information of individuals.[10] In a report from the 1972 match, the adjusted mean income of families headed by a person aged 65 or older was 41 percent higher than that found in the CPS.[11]

Social Security beneficiary status.—Beneficiary status is measured by the yes/no answer to the question in the CPS on receipt of Social Security benefits. Missing answers are imputed by the Census Bureau (as referenced above).

Although Social Security benefits are referred to as retirement benefits in these tabulations, Social Security beneficiaries include not only retired workers, but also dependent spouses, dependents or survivors with young children in their care, and the disabled. According to SSA records at the end of 1998, 97 percent of persons aged 55–59 with a Social Security benefit were disabled; the remaining 3 percent were parents with young children in their care. At age 60, old-age benefits are available to survivors. Men aged 60–61 receiving a benefit are all disabled except

for a very small number of widowers. Sixty-one percent of women aged 60-61 receiving a benefit were disabled; the remainder were aged widows and those with young children in their care. At age 62, reduced retired-worker and dependent's benefits are available. Among persons 62–64, the proportions of beneficiaries with disability benefits were 23 percent of men and 15 percent of women. Almost all remaining men in this age group were receiving retired-worker benefits. Only a small number received father's or widower's benefits. The remaining women 62–64 were receiving benefits as retired workers, dependents, or survivors.[12]

Reliability of the Estimates

Because the figures in this report are based on a sample of the older population, all reported statistics (counts, percentages, and medians) are only estimates of population parameters and may deviate somewhat from their true values— that is, from the values that would have been obtained from a complete census using the same questionnaires, instructions, and interviewers.[13]

The standard error is primarily a measure of sampling variability—that is, of the variations that occur by chance because a sample rather than the entire population is surveyed. As calculated for this report, the standard error also partly measures the effect of response and enumeration errors but does not measure systematic biases in the data. The chances are about 68 out of 100 that an estimate for the sample would differ from a complete census figure by less than the standard error. The chances are about 95 out of 100 that the difference would be less than twice the standard error.

Standard error of estimated percentages.—The reliability of an estimated percentage, computed by using sample data for both

numerator and denominator, depends on both the size of the percentage and the size of the total on which the percentage is based. The approximate standard error S_x of an estimated percentage can be obtained using the formula

$$S_{x,p} = \sqrt{\frac{b}{x} p(100-p)}$$

Here x is the total number of persons, families, or households which is the base of the percentage, p is the percentage, and b is the parameter in table A associated with the characteristic in the numerator of the percentage. Use of this formula in calculating the standard error of a single percentage is illustrated as follows:

An estimated 28 percent of units aged 65 or older had total money incomes of $30,000 or more in 1998 (table III.1). Because the base of this percentage is approximately 24,644,000— the number of units aged 65 or older—the standard error of the estimated 28 percent is approximately 0.4 percent. The chances are 68 out of 100 that the estimate would have shown a figure differing from a complete census by less than 0.4 percent. The chances are 95 out of 100 that the estimate would have shown a figure differing from a complete census by less than 0.8 percent—that is, this 95-percent confidence interval would range from 27.2 percent to 28.8 percent.

For a difference between two sample estimates, the standard error is approximately equal to the square root of the sum of the squares of the standard errors of each estimate considered separately. This formula will represent the actual standard error quite accurately for the difference between separate and uncorrelated characteristics. If, however, there is a high positive correlation between the two characteris-

tics, the formula will overestimate the true standard error.

A comparison of the difference in the percentage of units aged 62–64 and 65 or older who had total money incomes of $30,000 or more in 1998 illustrates how to calculate the standard error of a difference between two percentages:

Twenty-eight percent of the 24,644,000 units aged 65 or older and 47 percent of the 3,997,000 units aged 62-64 had total money incomes of $30,000 or more in 1998—a difference of 19 percentage points. The standard errors of these percentages are 0.4 and 1.2, respectively. The standard error of the estimated difference of 19 percentage points is about

$$1.3 = \sqrt{(0.4)^2 + (1.2)^2}$$

The chances are 68 out of 100 that the difference is between 17.7 and 20.3 percentage points and 95 out of 100 of being between 16.4 and 21.6 percentage points. Because the confidence interval around the difference does not include zero, there is a statistically significant difference between the proportions who are 62–64 and those who are 65 or older with income of $30,000 or more.

Confidence limits of medians.—The sampling variability of an estimated median depends on the distribution as well as on the size of the base. Confidence limits of a median based on sample data may be estimated as follows: (1) Using the appropriate base, the standard error of a 50-percent characteristic is determined; (2) the standard error determined in step 1 is added to and subtracted from 50 percent; and (3) the confidence interval around the median corresponding to the two points estimated in step 2 is then read from the distribution of the characteristic. A two-standard-error

confidence limit may be determined by finding the values corresponding to 50 percent plus and minus twice the standard error. This procedure may be illustrated as follows:

The median total money income of the estimated 24,644,000 units aged 65 or older was $17,777 in 1998 (table III.1). The standard error of 50 percent of these units expressed as a percentage is about 0.50 percent. As interest usually centers on the confidence interval for the median at the two-standard-error level, it is necessary to add and subtract twice the standard error obtained in step 1 from 50 percent. This procedure yields limits of approximately 49 percent and 51 percent. By interpolation, 49 percent of units 65 or older had total money incomes below $17,278 and 51 percent had total money incomes below $18,359. Thus, the chances are about 95 out of 100 that the census would have shown the median to be greater than $17,278 but less than $18,359.

Table A.—Standard error parameter b for poverty and income characteristics of persons 65 and over, 1998

Characteristic	Total or white	Black	Hispanic
Below poverty level.	3,927	3,927	3,927
All income levels.....	2,454	2,810	2,810

Notes

[1] *Income of the Population 55 or Older,* Social Security Administration, biennial report beginning with 1976 data.

[2] For a detailed description of the basic CPS sample design, see U.S. Census Bureau, *The Current Population Survey: Design and Methodology,* Technical Paper No. 40, 1978.

[3] These changes are discussed in some detail in the U.S. Census Bureau, *Current Population Reports,* Series P-60, various years.

[4] The Census Bureau classifies families by characteristics of the householder—the first person in whose name a home is listed as owned or rented.

[5] "Money Income in the United States, 1998," *Current Population Reports,* Series P-60, No. 206, September 1999, table A.

[6] For a detailed discussion of these imputation procedures, see "Computer Method to Process Missing Income and Work Experience Information in the Current Population Survey," by Emmett F. Spiers and Joseph J. Knott in *Proceedings of the Social Statistics Section, 1969,* American Statistical Association. A more recent adjustment to the CPS imputation technique is described by Charles Nelson in "Adjusted Imputed Interest Amounts Based on Results of the CPS-IRS Exact Match" (Memorandum for John Coder, Chief, Income Statistics Branch, Population Division, U.S. Bureau of the Census, October 2, 1985). A brief description of revisions to the processing system as of March 1989 can be found in the U.S. Census Bureau, *Current Population Reports,* Series P-60, No. 166, 1989. For an overview of imputation techniques and an extensive reference list, see "Imputing for Missing Survey Responses," by Graham Kalton and Daniel Kasprzyk in *Proceedings of the Section on Survey Research Methods, 1982*, American Statistical Association.

[7] Constance F. Citro and Robert T. Michael, *Measuring Poverty: A New Approach,* Washington, DC, National Academy Press, 1995.

[8] U.S. Bureau of the Census, "Experimental Poverty Measures: 1996–1997," *Current Population Reports,* Series P-60, No. 205.

[9] *Current Population Reports,* No. 184, September 1993, table C-1.

[10] See Social Security Administration, *Studies From Interagency Data Linkages,* a series of seven reports, including an introductory paper, published between August 1973 and June 1975.

[11] Daniel B. Radner, "Distribution of Family Income: Improved Estimates," *Social Security Bulletin,* July 1982, pp. 13-21.

[12] *Social Security Bulletin, Annual Statistical Supplement, 1999,* tables 5.A1 and 5.A10.

[13] Most of the discussion of estimation procedures has been excerpted from *Current Population Reports,* No. 114, July 1978.